



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/767,335 | 01/30/2004 | Kazutoshi Shiba | Q79657 | 5230 |

23373 7590 05/18/2006

SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER

RAO, SHRINIVAS H

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

2814

DATE MAILED: 05/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/767,335

Applicant(s)

SHIBA ET AL.

Examiner

Steven H. Rao

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) 9 and 10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) 4-8 is/are allowed.
- 6) ☐ Claim(s) 1 and 2 is/are rejected.
- 7) ☐ Claim(s) 11-14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 February 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 03/07/2006 has been entered.

The parent case U.S. Serial No. 10/767,335 filed on 01/30/2004 itself claims priority from Japanese Patent Application No. 2003-024300 under 35 U.S.C. 119 filed on January 31, 2003 .

Preliminary Amendment

Applicants' amendment filed on November 22, 2005 has been entered after the entering of the RCE on March 07, 2006.

Therefore claims 1, 4,5, 7, 8, and presently newly added claims 11 to 14 are currently pending in the Application.

Claims 9 and 10 were previously withdrawn.

Allowable Subject Matter

Claims 4-8 are allowed for reasons set out in the previous Office Action.

Dependent claims 11-14 include allowable subject matter but depend from rejected claim 1 . Dependent claims 11-14 may be allowable if rewritten in independent form and including all limitations.

Claim Rejections - 35 USC Section 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action.

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Cleemput et al. (U.S. Patent No. 6,576,345, herein after Cleemput) in view of Applicants' admitted prior art, (herein after AAPR) .

With respect to claim 1 , Cleemput describes a semiconductor device, comprising: a semiconductor substrate', (figure 2 3101, col. 6 line 16) a low dielectric constant film constituted essentially of a ladder-type hydrogen siloxane provided on semiconductor substrate, (figure 2 3102, col. 6 line 14).

Cleemput does not specifically describe a protection film consisting essentially of silicon dioxide provided on said low dielectric constant film.

However , AAPR in figures IA-B and specification pages 2-3 describes a protection film provided on said low dielectric constant film and in specification page

Art Unit: 2814

line 10 –silicon dioxide to a barrier film (5) to provide an inert interface isolation and prevent damage in subsequent process like high temperatures and etching.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include AAPR"S barrier film containing essentially silicon dioxide in Cleemput's device to provide an inert interface isolation and prevent damage in subsequent process like high temperatures and etching.

The remaining limitations of claim 1 are : and a metal interconnect formed in said low dielectric constant film and said protection film. (AAPR figure 1 A , B) ..

With respect to claim 2 Cleemput describes the semiconductor device as recited in Claim 1 , wherein said protection film is constituted of a material having greater polishing resistance against a chemical mechanical polishing process than said low dielectric constant film. (Inherent property and AAPR specification page 2 e.g. Ta, etc. having greater resistance than SiN).

Response to Arguments

Applicant's arguments filed on 02/17/06 with respect to claims 1 and 2 have been fully considered but they are not persuasive because claim1 has been amended to include the limitation previously rejected claim 3 .

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven H. Rao whose telephone number is (571)272-1718. The examiner can normally be reached on 8.00 to 5.00.

Art Unit: 2814

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Fahmy Wael can be reached on (571) 272-1714. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

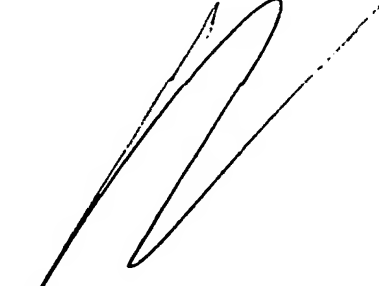
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Steven H. Rao

Patent Examiner

May 12, 2006.



LONG PHAM
PRIMARY EXAMINER